

UNIT II**PART A****1. Discuss about economics of water resources planning.**

Economic analysis and prediction of decision making under conditions of resource scarcity, plays a major role in the planning, design and management of sustainable water resources systems.

2. What are the guiding criteria concerns of hydro economic policy?

- i) To ensure the use of fresh water is affordable to low-income households.
- ii) To ensure the husbandry of water in its supply and use
- iii) To purify water from domestic, agricultural and industrial effluents

3. What are the two types of cost involved in irrigation projects?

Irrigation project costs include all the expenditure made to establish, maintain and operate a project.

Costs are estimated on an annual basis. The annual cost of a project includes two types fixed and variable cost.

4. Define fixed costs with example?

Fixed costs also referred as investment or initial costs, include the interest on the total investment on the project.

Example:-

- a. Cost of wells, pumps, electric motors and pumping plant accessories and their installation.
- b. Pump house
- c. Cost of storage reservoirs, head regulators and canal water distribution system including associated structures and controls.

5. Define variable cost with example?

Variable costs are of a recurring nature computed on an annual basis. They are operation and maintenance costs as well as levies and charges on insurance and miscellaneous operating costs of recurring nature.

Example:-

- a. Maintenance of structure and water distribution network
- b. Cost of fuel, namely diesel or other fuels and electricity
- c. Lubricants, minor repairs and painting

6. Mention the methods involved in economic evaluation of irrigation projects?

- a. Benefit cost ratio criterion
- b. Cost per hectare criterion
- c. Net present value
- d. Internal rate of return method

7. What is meant by benefit cost ratio?

It is the ratio of annual benefits to the annual cost.

Thus $b/c \text{ ratio} = \text{total annual benefits} / \text{total annual costs}$

8. How to assess the project is economically viable for irrigation project?

The project which gives a benefit / cost ratio (B/C) greater than unity is economically viable. Of course, the greater the B/C ratio of 1.5 is usually specified for irrigation projects.

9. Discuss the major recommendation made under national water policy?

- ✓ Adapting to climate changes
- ✓ Enhancing water availability
- ✓ Water demand management through efficient water use practice
- ✓ Water pricing
- ✓ Conservation of river corridors, water bodies, infrastructure
- ✓ Project planning and implementation
- ✓ Management of floods and droughts
- ✓ Water supply and sanitation
- ✓ Institutional arrangements
- ✓ Trans- Boundary Rivers
- ✓ Database and information system
- ✓ Research and training needs.

10. Discuss the points about water allocation priorities in National Water Policy 1987.

The policy laid down an allocation prioritization principle for water as follows

- Drinking water
- Irrigation
- Hydro power
- Navigation
- Industrial and other uses

11. What is the emphasis on water allocation priorities in National Water Policy 2002?

- a. Drinking water
- b. Irrigation
- c. Hydro power

- d. Ecology
- e. Agricultural industries and non agricultural industries
- f. Navigation and other uses

12. Discuss the salient feature of national water policy 2002.

- Since the distribution of water is spatially uneven for water scarce area, local technologies like rain water harvesting in the domestic or community level has to be implemented.
- Technology for/ artificial recharge of water has to be bettered.
- Desalination methods may be considered for water supply to coastal towns.

13. Briefly discuss about necessity of national water policy or write short notes on national water policy.

National Water board should prepare a plan of action based on the National Water Policy as approved by the national water resources council, and to regularly monitor its implementation. The National Water Policy (NWP) makes recommendations on several major issues including

- Adapting to climate changes
- Enhancing water availability
- Water demand management through efficient water use practices and water pricing.
- Project planning and implementation
- Management of floods and droughts
- Water supply and sanitation
- Preparation of a plan of action by the National Water Board based on the National water policy.

14. List few major aspects considered in formulating State Water Policy?

- ❖ Importance of water resources in the development of the state
- ❖ Priorities for water use in the state
- ❖ Management and development of ground water resources.
- ❖ Increase in demand for non-agricultural uses.
- ❖ Management of water quality and environmental aspects.

15. Differentiate b/w consumptive and non- consumptive use of water?

Consumptive use: It is the amount of water lost in evapo-transpiration from vegetation and its surrounding land to the atmosphere, inclusive of the water used by the plants for building their tissues and to carry on with their metabolic processes.

Non consumptive use: Non consumptive uses do not reduce the volume of water available to that stage of the water cycle. Non consumptive uses include inland navigation, recreation and water sports, fisheries, hydropower production and ecosystem maintenance.

16. List out the factors affecting the consumptive use of water.

- a. Evaporation, which depends upon humidity
- b. Mean monthly temperature
- c. Growing season of crop and cropping pattern
- d. Monthly precipitation in the area
- e. Irrigation depth or the depth of water applied for irrigation
- f. Wind velocity in the locality
- g. Soil and topography
- h. Irrigation practice and methods of irrigation

17. What is the general purpose of master plan?

The purpose of master plan for water resources is to provide long-term perspective for planning, including resources conservation using techniques like system analysis and mathematical modeling as planning tools, wherever applicable.

18. Define water budget.

A water budget is an accounting of all the water that flows into and out of a project area. This area can be a wetland, a lake or any other point of interest. The water budget typically includes

- i) Precipitation (P)
- ii) Evaporation (E)
- iii) Evapotranspiration (ET)
- iv) Surface runoff (SR)
- v) Ground water flow (GF)

19. State the water budget equation.

The water budget is expressed as an equation relating these components.

$$\Delta S = P - E - ET \pm SRO \pm GF$$

Where ΔS is the change in storage.

20. What is meant by conjunctive use in water resources?

The combined use of surface and subsurface water resources of a given area in a judicious manner to derive maximum benefits is called conjunctive use of water.